

## CLINICAL IMAGE

# MGUS bone

Osamu Imataki<sup>\*,†</sup> and Makiko Uemura

Division of Hematology, Department of Internal Medicine, Faculty of Medicine, Kagawa University, Kagawa, Japan

\*Correspondence address. Division of Hematology, Department of Internal Medicine, Faculty of Medicine, Kagawa University, 1750-1 Ikenobe, Miki-cho, Kita-gun, Kagawa, 761-0793, Japan. Tel: +81 878-91-2145; Fax: +81 878-91-2147; E-mail: oima@med.kagawa-u.ac.jp

## Abstract

A 65-year-old man was referred to our hospital to undergo orthopedic surgery due to severe cervical ossification of the posterior longitudinal ligament. Computed tomography scanning showed a massive osteolytic lesion in his pelvis. Other screening examinations including detection of bone mineral density and osteoporosis biomarkers, bone scintigram and <sup>18</sup>F-fluorodeoxyglucose-positron emission tomography were all normal. Bone marrow aspiration revealed slightly increased plasmacytes at 3.8%. These findings led to a diagnosis of monoclonal gammopathy with undetermined significance (MGUS). Architectural osteolytic bone associated with MGUS without apparent abnormality in bone mineral metabolism could be a common occurrence prior to onset or occurrence of multiple myeloma.

A 65-year-old man was referred to our hospital because of severe cervical ossification of the posterior longitudinal ligament (OPLL), which needed to be operated on. He underwent screening computed tomography (CT) from the chest to the pelvis. CT findings revealed osteolytic lesions with worm-eaten appearance, especially in his pelvis (Fig. 1). We examined his bone via bone scintigram and <sup>18</sup>F-fluorodeoxyglucose (FDG)-positron emission tomography/CT. Bone metabolism was not increased and abnormal <sup>18</sup>F-FDG uptake was not observed. Bone marrow aspiration test results did not show plasmacytic neoplasm. Osteoresorption (TRACP-5b)/osteoplastic (bone type ALP) markers were within normal range, and serum protein fraction or electrophoresis did not indicate the presence of monoclonal protein. IgA, G or M levels did not increase. Immunoglobulin suppression was not present. Paraproteinosis was detected based on restricted serum  $\kappa/\lambda$  ratio, which was 163.0/17.10 mg/dl (9.532). The patient's bone mineral density

was within the normal range; therefore, he did not meet the diagnostic criteria for osteoporosis. Bone marrow trepan biopsy revealed normocellular marrow without neoplasm or dysplasia (Fig. 2). Plasmacytes were slightly elevated at 3.8% among all nuclear cells in the bone marrow. Our final diagnosis was monoclonal gammopathy with undetermined significance (MGUS) with associated bone lesions in the pelvis, referred to as 'MGUS bone'. This bone is believed to develop differently from myeloma bone lesions or osteoporosis [1]. His OPLL would be treatable via orthopedic intervention, and MGUS typically does not require treatment. However, further consideration would be needed if monoclonal plasmacytes were increased. Such MGUS cases might be treated better in the future considering the background pathophysiology. The incidence and risk of any fracture increases in MGUS patients despite evidence of healthy bone mineral metabolism and density [2, 3]. This may reflect the early phase of disease-related osteopathy occurring in the

†Osamu Imataki, <http://orcid.org/0000-0001-5332-1316>

Received: April 29, 2019. Revised: July 10, 2019. Accepted: July 20, 2019

© The Author(s) 2019. Published by Oxford University Press.

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/4.0/>), which permits non-commercial re-use, distribution, and reproduction in any medium, provided the original work is properly cited.

For commercial re-use, please contact [journals.permissions@oup.com](mailto:journals.permissions@oup.com)

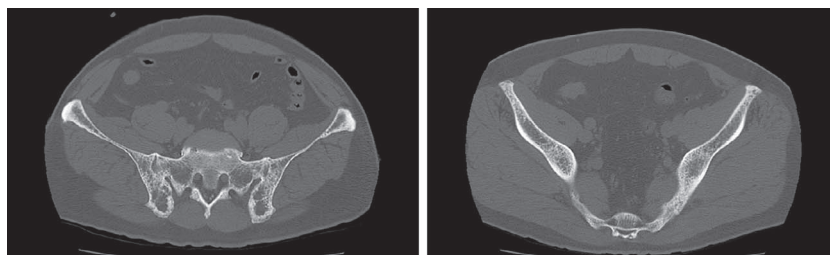


Figure 1: The patient's CT findings in his pelvic bone.

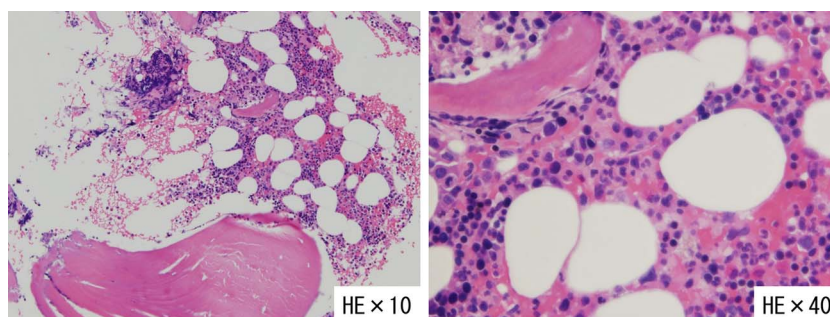


Figure 2: The pathological findings of the patient's bone marrow biopsy.

natural course of plasma cell neoplasms [4]. Therefore, osteolytic lesions could be observed for monoclonal gammopathy even in the absence of bone abnormality.

### AUTHORS' CONTRIBUTIONS

O.I. drafted and wrote the manuscript. O.I. managed the patient's case. M.U. contributed to the literature search. M.U. made substantial contributions to the concept and design of this report. M.U. qualified and suggested important intellectual content. All authors approved the final version of the manuscript.

### CONFLICT OF INTEREST STATEMENT

None declared.

### FUNDING

We do not have any funding source to disclose concerning to this report.

### INFORMED CONSENT

Informed written consent was obtained from the patient for the publication of their information and imaging.

### REFERENCES

1. Thorsteinsdottir S, Lund SH, Lindqvist EK, Thordardottir M, Sigurdsson G, Costello R, et al. Bone disease in monoclonal gammopathy of undetermined significance: results from a screened population-based study. *Blood Adv.* 2017;1:2790–8.
2. Veronese N, Luchini C, Solmi M, Sergi G, Manzato E, Stubbs B. Monoclonal gammopathy of undetermined significance and bone health outcomes: a systematic review and exploratory meta-analysis. *J Bone Miner Metab.* 2018;36:128–32.
3. Kristinsson SY, Tang M, Pfeiffer RM, Björkholm M, Blimark C, Mellqvist UH, et al. Monoclonal gammopathy of undetermined significance and risk of skeletal fractures: a population-based study. *Blood.* 2010;116:2651–5.
4. Xu S, De Veirman K, De Becker A, Vanderkerken K, Van Riet I. Mesenchymal stem cells in multiple myeloma: a therapeutic tool or target? *Leukemia.* 2018;32:1500–14.